REMARKS

In the foregoing amendment, claim 1 is amended and claim 16 added. Now pending in the application are claims 1, 3-4, 6 and 7-16, of which claims 3-4 and 7-15 have been withdrawn from further consideration. Claim 1 is independent and claims 6 and 16 depends from claim 1.

I. Claim Amendments

Claim 1 is amended to clarify that the entire area of the separator is substantially flat. Support for the claim amendment can be found in Figures 4, 5 and 11 and corresponding descriptions in the specification of the pending application. No new matter is added.

II. Summary of Rejections

Claims 1 and 6 are rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Publication No. 2002-208153.

Claims 1 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Publication No. 2002-208153 in view of U.S. Patent No. 5,342,706.

Claims 1 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Publication No. 2002-208153 in view of U.S. Patent No. 5,531,956.

III. Claim Rejections under 35 U.S.C. §102

Claims 1 and 6 are rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Publication No. 2002-208153 ("JP 2002-208153"). Applicants respectfully traverse the rejection.

A. Claim 1

Claim 1 is directed to a separator assembly for a fuel cell stack. The separator assembly has a diffusion layer including a porous metal body for supplying one of fuel and oxidizer to an electrode of the fuel cell stack. The separator assembly also has a separator including a metal plate disposed adjacent to the diffusion layer. The entire area of the separator is substantially

flat and welded with the diffusion layer. Flow passage partitions are formed in the diffusion layer so as to define a flow passage for the fuel or oxidizer in the diffusion layer.

Applicants submit that JP 2002-208153 does not disclose that *the entire area of the separator is substantially flat*, and *the separator and the diffusion layer are welded together*, as required by claim 1.

JP 2000-208153 relates to a solid polymer electrolyte fuel cell. JP 2000-208153 discloses in Fig. 1 that the separator (1) is press molded into corrugated form. JP 2000-208153 also discloses that the protruding parts of the corrugated separator (1) are bonded to the gas diffusion layer (2) by resistance welding. JP 2000-208153, however, does not disclose that the entire area of the separator is substantially flat, as required by claim 1.

In the Office Action, the Examiner notes that the non-corrugated areas of the separator (1) are flat in JP 2000-208153. See the Office Action, page 5. JP 2000-208153, however, does not disclose that the entire area of the separator is substantially flat, as required in claim 1. Although the non-corrugated areas of the separator (1) may be flat in JP 2000-208153, JP 2000-208153 does not disclose that the entire area of the separator is flat.

As such, Applicants respectfully submit that JP 2000-208153 does not disclose each and every element of claim 1. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 1 under 35 U.S.C. §102(b), and pass the claims to allowance.

B. Claim 6

Claim 6 depends from claim 1 and adds separate and patentable limitations to claim 1. Claim 6 recites a cooling layer including a porous metal body for allowing coolant to flow through, which is disposed adjacent to the separator and opposite the diffusion layer with respect to the separator. The cooling layer and the separator are welded together by laser welding. The flow passage partitions of the metal body forming the cooling layer, which are formed by melting the metal body by irradiation by a laser beam and by solidifying the metal body, are formed in the cooling layer so as to define a flow passage for the coolant in the cooling layer.

Applicants submit that JP 2000-208153 does not disclose *a cooling layer including a porous metal body wherein flow passage partitions of the metal body forming the cooling layer are formed in the cooling layer so as to define a flow passage for the coolant in the cooling layer*, as required by claim 6. The Examiner alleges that the cooling water passage (7) of JP 2000-208153 corresponds to the cooling layer recited in claim 6. See the Office Action, page 5. Applicants respectfully disagree.

In Figure 4, JP 2000-208153 discloses that the cooling water passage (7) is formed in the space between corrugated separators (1). JP 2000-208153, however, does not disclose that the cooling water passage (7) is formed in a porous metal body. JP 2000-208153 does not disclose that the flow passage partitions of the metal body are formed in the porous metal body to define a flow passage for the coolant, as required by claim 6.

In light of the foregoing claim amendments and arguments, Applicants respectfully submit that JP 2000-208153 does not disclose each and every element of claim 6. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 6 under 35 U.S.C. §102(b), and pass the claim to allowance.

IV. Claim Rejections under 35 U.S.C. §103

Claims 1 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Publication No. 2002-208153 ("JP 2002-208153") in view of U.S. Patent No. 5,342,706 ("Marianowski"). Applicants respectfully traverse the rejection.

A. Claim 1

Applicants submit that JP 2002-208153 and Marianowski do not teach that *the entire area of the separator is substantially flat*, and *the separator and the diffusion layer are welded together*, as required by claim 1. The Examiner cites the Marianowski references to provide teachings for the feature that the separator is substantially flat. See the Office Action, pages 10-11.

Marianowski teaches an internally manifolded fuel cell stack in which a plurality of aligned perforations (24, 25) are formed in each separator plate (40). Marianowski also teaches that each perforation formed through the separator plate (40) is surrounded by a flattened manifold wet seal structure (45, 46). In column 9, line63 to column 10, line 6, which is referenced by the Examiner, Marianowski teaches that "the principles of this invention are also applicable to flat separator plates."

Marianowski only teaches that a plurality of aligned perforations can be formed in the flat separator plate, and the perforations can be surrounded by wet seals. Marianowski, however, does not teach that the flat separator and the diffusion layer refer are welded together, as required in claim 1. Marianowski does not teach a diffusion layer at all.

Additionally, Applicants submit that there is no motivation to combine the teachings of JP 2002-208153 and Marianowski. The Examiner asserts in the Office Action that it would have been obvious to replace the corrugated separator of JP 2002-208153 with the flat separator plate taught in the Marianowski reference. See the Office Action page 11. Applicants respectfully disagree with the Examiner.

If the corrugated separator of JP 2002-208153 is replaced with the flat separator plate taught in the Marianowski reference, the oxidant gas passages (5) and the fuel gas passages (6) are not formed, and hence the reactant gases cannot be distributed to the electrodes of the fuel cell in JP 2002-208153. Since the combination of the prior art references, as suggested by the Examiner, disables the operation of the fuel cell in JP 2002-208153, those of ordinary skill in the art would not be motivated to replace the corrugated separator of JP 2002-208153 with the flat separator plate taught in the Marianowski reference.

As such, Applicants respectfully submit that claim 1 is not obvious over JP 2000-208153 and Marianowski. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 1 under 35 U.S.C. §103(a), and pass the claim to allowance.

B. Claim 6

Applicants submit that JP 2000-208153 and Marianowski do not teach *a cooling layer including a porous metal body wherein flow passage partitions of the metal body forming the cooling layer are formed in the cooling layer so as to define a flow passage for the coolant in the cooling layer*, as required by claim 6. The Examiner alleges that the cooling water passage (7) of JP 2000-208153 corresponds to the cooling layer recited in claim 6. See the Office Action page 9. Applicants respectfully disagree.

As discussed above, JP 2000-208153 teaches that the cooling water passage (7) is formed in the space between corrugated separators (1). JP 2000-208153, however, does not teach that the cooling water passage (7) is formed in a porous metal body. JP 2000-208153 does not teach that the flow passage partitions of the metal body are formed to define a flow passage for the coolant, as required by claim 6.

As such, Applicants respectfully submit that JP 2000-208153 and Marianowski do not teach all of limitations of claim 6. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 6 under 35 U.S.C. §103(a), and pass the claims to allowance.

V. Claim Rejections under 35 U.S.C. §103

Claims 1 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Publication No. 2002-208153 ("JP 2002-208153") in view of U.S. Patent No. 5,531,956 ("Ong"). Applicants respectfully traverse the rejection.

A. Claim 1

Applicants submit that JP 2002-208153 and Ong do not teach that *the entire area of the separator is substantially flat*, and *the separator and the diffusion layer are welded together*, as required by claim 1. The Examiner cites the Ong references to provide teachings for the feature that the separator is substantially flat. See the Office Action, pages 14-15.

Ong teaches a ribbed electrode for a fuel cell. Ong also teaches that the rib structure of an electrode creates a plurality of channel-like voids between the electrode and the flat separator plate. In Ong, the channel-like voids allow the reactant gas to be distributed over the electrode. Ong, however, does not teach that the flat separator plate and a diffusion layer are welded together, as required in claim 1. Ong does not teach a diffusion layer at all.

Additionally, Applicants submit that there is no motivation to combine the teachings of JP 2002-208153 and Ong. The Examiner asserts in the Office Action that it would have been obvious to replace the corrugated separator of JP 2002-208153 with the flat separator plate taught in the Ong reference. See the Office Action, page 14. Applicants respectfully disagree with the Examiner.

If the corrugated separator of JP 2002-208153 is replaced with the flat separator plate taught in the Ong reference, the oxidant gas passages (5) and the fuel gas passages (6) are not formed, and hence the reactant gases cannot be distributed to the electrodes of the fuel cell in JP 2002-208153. Since the combination of the prior art references, as suggested by the Examiner, disables the operation of the fuel cell in JP 2002-208153, those of ordinary skill in the art would not be motivated to replace the corrugated separator of JP 2002-208153 with the flat separator plate taught in the Ong reference.

As such, Applicants respectfully submit that claim 1 is not obvious over JP 2000-208153 and Ong. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 1 under 35 U.S.C. §103(a), and pass the claims to allowance.

B. Claim 6

Applicants submit that JP 2000-208153 and Ong do not teach *a cooling layer including a porous metal body wherein flow passage partitions of the metal body forming the cooling layer are formed in the cooling layer so as to define a flow passage for the coolant in the cooling layer*, as required by claim 6. The Examiner alleges that the cooling water passage (7) of JP 2000-208153 corresponds to the cooling layer recited in claim 6. See the Office Action page 13. Applicants respectfully disagree.

As discussed above, JP 2000-208153 teaches that the cooling water passage (7) is formed in the space between corrugated separators (1). JP 2000-208153, however, does not teach that the cooling water passage (7) is formed in a porous metal body. JP 2000-208153 does not teach that the flow passage partitions of the metal body are formed to define a flow passage for the coolant, as required by claim 6.

As such, Applicants respectfully submit that JP 2000-208153 and Ong do not teach all of limitations of claim 6. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 6 under 35 U.S.C. §103(a), and pass the claims to allowance.

VI. New Claim

Applicants add new claim 16 to clarify the scope of the claimed invention. New claim 16 recites that "a height of the flow passage partition formed in the diffusion layer is substantially the same as a thickness of the metal body." Support for the new claim can be found in Figures 5 and 11 and corresponding descriptions in the specification of the present application. No new matter is added.

In the Office Action, the Examiner notes that "the welding part 10 formed in the diffusion layer is also part of the partition formed therein." See the Office Action, page 16, section 11. The welding part (10), however, does not have a height that is substantially the same as the thickness of the metal body. In view of this, Applicants submit that new claim 16 recites patentably distinct subject matter over the cited prior art. Applicants therefore request that the Examiner pass the claim to allowance.

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VII. Conclusion

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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